

# CORROSION

*Official Publication*

NATIONAL ASSOCIATION  
OF  
CORROSION ENGINEERS



VOLUME 9

JANUARY THROUGH DECEMBER

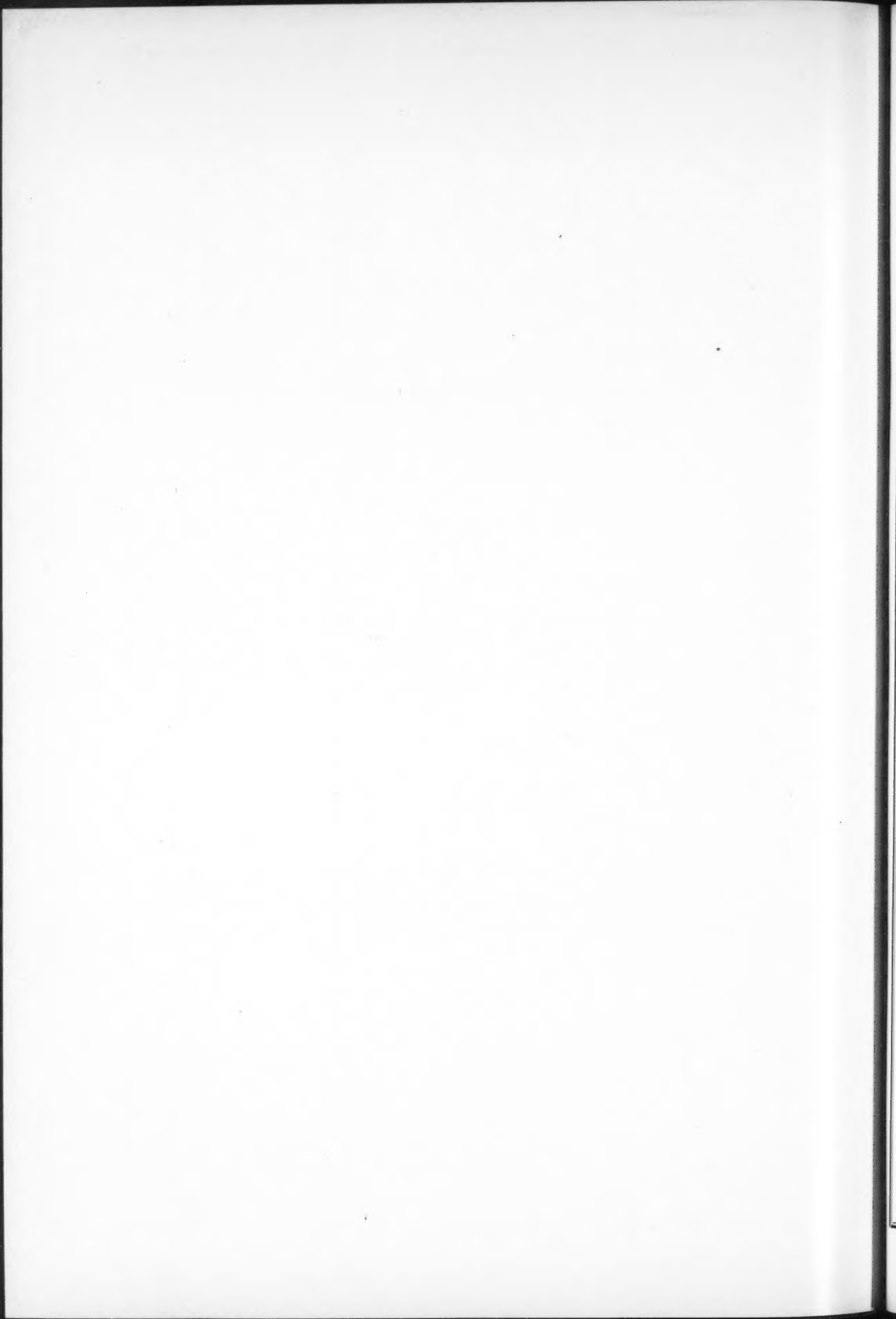
1953



EDITORIAL AND BUSINESS OFFICES  
1061 M & M BLDG., HOUSTON 2, TEXAS



(Contents of the Issues Included in This Volume Are Copyrighted and May Not Be Used  
Without Permission of the Association)



## INDEX TO TECHNICAL MATERIAL

# CORROSION

## VOLUME 9

JANUARY 1—DECEMBER 31

1953

## C O N T E N T S

Topical Index to Corrosion Abstracts

Tabular Cross Index to Subject Matter  
Which Includes:

1. Contents chronologically
2. Contents in page sequence

Authors, Alphabetically

## PAGE NUMBERS BY MONTHS

Pages		Pages	
1- 44	January	209-244	July
45- 76	February	245-296	August
77-106	March	297-334	September
107-150	April	335-384	October
151-190	May	385-438	November
191-208	June	439-478	December

# TOPICAL INDEX HEADINGS

From the Abstract Filing Index Compiled by the Abstract Committee, National Association of Corrosion Engineers

(Revision as of August 19, 1952)

**History of Index**—The project of originating a topical index under which abstracts dealing with corrosion can be classified was begun by the NACE Abstract Committee in January, 1947, under the chairmanship of Mrs. Lorraine Voigt Peloubet. This index, in the revision dated August, 1952, is the one used herein for the purpose of cross-indexing technical articles published in CORROSION in the year 1953.

**Description of Index**—First column of the tabular index contains the titles and authors of technical articles published in CORROSION arranged chronologically by year and month (Volume and Issue) and the number of the page on which the listed article begins. Discussions are entered only when separated from the article to which they refer. Each of the eight major columns to the right is numbered to correspond to the primary subject in the Abstract Filing Index. Within each of the major columns are numbered columns cor-

responding to the sub-topic or secondary subject of the topical index. When the subject matter of an article falls into the topic indicated by any of the first two index numbers, the sub-topic number is placed in the column. Under the alphabetical index of authors, each author's contributions are indexed by year and page number.

**How to Use Index**—To discover the subject matter of a known article, first find the article in the left hand column, search horizontally to the correct numbered columns, then to column headings to learn the secondary and primary topical classification numbers; then refer to the Abstract Filing Index to learn the topic corresponding to the numbers. To search for a topic in an unknown article, first refer to the index and note the two numbers corresponding to the topic. Refer to the column headings of the table, find the major and minor columns corresponding to the number, and trace down vertically until a number is found. Then search horizontally to the title of the article to which the number refers.

## 1. GENERAL

1. Miscellaneous
  2. Importance
    1. General
    2. Economics
    3. Effect on Specifications
    4. Prevention in National Defense
    5. Safety and Toxicity
    6. Other
3. Reviews
4. Bibliographies and Indexes
5. Directories of Material
6. Books
7. Organized Studies of Corrosion
  1. Organizations
    - a. General
    - b. Government cooperative activities
    - c. Technical committee activities
    - d. Other
  2. Test Sites
  3. Other
8. Personalities and Directories of Individuals

## 2. TESTING

1. General
  1. Calculations and Statistics
  2. Criteria for Evaluation
  3. Other
2. On Location Tests
  1. General
  2. Atmospheric Exposure
  3. Service, Evaluation of Materials
  4. Service, Testing of Equipment
  5. Service, Testing of Coatings
  6. Soil Exposure (including surveys)
  7. Waters
  8. Other
3. Laboratory Methods and Tests
  1. General
  2. Accelerated Tests
    - a. General
    - b. Cu strip
    - c. Drop test
    - d. Intergranular test
    - e. Weathering
      - (1) General
      - (2) Spray
      - (3) Exposure to light
      - (4) Other
    - f. Other
  3. Biological Control
  4. Chemical Methods
    - a. General
    - b. Immersion
      - (1) General
      - (2) Alternate
      - (3) Partial
      - (4) Total
    - c. Method of analysis
    - d. Other
  5. Electrochemical and Electrical Methods
    - a. General
    - b. Galvanic couples
    - c. Potential measurements
    - d. Other
  6. Surface Examination
    - a. General
    - b. Electron microscope
    - c. Etching techniques
    - d. Optical methods
    - e. Other

## 2. TESTING—Continued

7. Physical Methods
  - a. General
  - b. Adhesion, permeability, thickness and hardness tests for coating
  - c. Erosion testing
    - (1) General
    - (2) Abrasion
    - (3) Cavitation-Erosion
    - (4) Erosion-Corrosion
    - (5) Impingement
    - (6) Velocity
    - (7) Other
  - d. Stress corrosion testing
    - (1) General
    - (2) Caustic embrittlement
    - (3) Fatigue
    - (4) Fretting
    - (5) Season cracking
    - (6) Other
  - e. Temperature
    - (1) General
    - (2) Differential (thermogalvanic)
    - (3) High
    - (4) Low
    - (5) Thermal shock
    - (6) Other
8. Pilot Plant
9. Special Techniques
  - a. General
  - b. Electrographic
  - c. Magnetic methods
  - d. Microbalance
  - e. Micrographic
  - f. Polarographic
  - g. Radioactive tracers
  - h. Radiation methods
    - (1) Gamma ray
    - (2) Electron diffraction
    - (3) X-ray technique
  - i. Other
  - j. Metallographic examination
  10. Other
4. Instrumentation
  1. General
  2. Corrosion Test Instruments or Equipment
  3. Non-destructive Inspection Methods
  4. Other
5. Specifications and Standardization
6. Preparation and Cleaning of Specimens
7. Other

## 3. CHARACTERISTIC CORROSION PHENOMENA

1. General
2. Forms
  1. General
  2. Localized Attack
    - a. General
    - (1) Local elements
    - (2) Theory and mechanism
    - (3) Other
  - b. Compositional changes
    - (1) General
    - (2) Carburizing
    - (3) Dezincification
    - (4) Embrittlement
      - (a) Hydrogen
      - (b) Other
    - (5) Graphitic corrosion
    - (6) Nitriding
    - (7) Other

## 3. CHARACTERISTIC CORROSION PHENOMENA (Continued)

- c. Cracking
  - (1) General
  - (2) Intergranular
  - (3) Transgranular
- d. Pitting
- e. Other
3. Uniform Attack
  - a. General
  - b. Films
    - (1) General
    - (2) Theory and mechanism
    - (3) Other
  - c. Other
  4. Other
3. Biological Effects
  1. General
  2. Fouling
  3. Macro-organisms
  4. Micro-organisms
    - a. General
    - b. Aqueous environment
    - c. Soil environment
    - d. Other
  5. Other
4. Chemical Effects
  1. General
  2. Catalytic Effects
  3. Composition of Corrosion Products
  4. Concentration (not conc. cells)
  5. Ionization
  6. Oxygen and Other Gases
  7. pH
  8. Specific Ions
  9. Water and Water Vapor
  10. Other
5. Physical and Mechanical Effects
  1. General
  2. Deposits
  3. Erosion
    - a. General
    - b. Abrasion
    - c. Cavitation
    - d. Erosion-Corrosion
    - e. Impingement
    - f. Other
  4. Light
  5. Permeability of Films and Coatings
  6. Porosity of Metals
  7. Pressure
  8. Stress
    - a. General
    - b. Cyclic
      - (1) General
      - (2) Fatigue
      - (3) Fretting
      - (4) Other
    - c. Internal stress
    - d. Static
      - (1) General
      - (2) Caustic embrittlement
      - (3) Season cracking
      - (4) Other
  - e. Other
  9. Temperature
    - a. General
    - b. Differential (thermogalvanic)
    - c. High
    - d. Low
    - e. Thermal shock
    - f. Other
  10. Time
  11. Velocity
  12. Other

## 3. CHARACTERISTIC CORROSION PHENOMENA (Continued)

6. Electrochemical Effects
  1. General
  2. Concentration Cells
    - a. General
    - b. Crevice corrosion
    - c. Differential aeration
    - d. Other
  3. Conductivity & Resistivity
  4. Contact Potentials
  5. Electro-motive Force
    - a. General
    - b. EMF series
    - c. Redox potential
    - d. Solution potential
    - e. Other
  6. Galvanic Effects—Bimetallic Contact
  7. Long-line Currents
  8. Polarization and Overvoltage
    - a. General
    - b. Depolarizers
    - c. Hydrogen overvoltage
    - d. Oxygen overvoltage
    - e. Other
  9. Stray Currents
  10. Other
7. Metallurgical Effects
  1. General
  2. Alloying Elements
  3. Fabrication and Heat Treatment
    - a. General
    - b. Heat treatment
    - c. Joints
      - (1) General
      - (2) Brazed
      - (3) Riveted
      - (4) Soldered
      - (5) Welded
      - (6) Other
    - d. Shaping and fabrication
    - e. Other
  4. Metallic Structure
    - a. General
    - b. Grain boundaries and size
    - c. Orientation
    - d. Other
8. Miscellaneous Principles
  1. General
  2. Electrochemical Theory
  3. Passivity
    - a. General
    - b. Experimental evidence
    - c. Theories
    - d. Other
  4. Other
9. Other

## 4. CORROSIVE ENVIRONMENTS

1. General
2. Atmospheric
  1. General
  2. Arctic
  3. Flue and Stack Gases
  4. Industrial
  5. Marine
  6. Rural
  7. Tropical
  8. Urban

**4. CORROSIVE ENVIRONMENTS (Continued)****3. Chemicals, Inorganic**

1. General
2. Acids, Acid Anhydrides, Acid Salts
3. Bases, Basic Anhydrides, Basic Salts
4. Mixtures
5. Non-metallic Elements
6. Salts
7. Other

**4. Chemicals, Organic**

1. General
2. Acids
3. Alcohols
4. Carbohydrates
5. Halide Compounds
6. Hydrocarbons
7. Mixtures
8. Nitrogen Compounds
9. Sulfur Compounds
10. Other

**5. Soil**

1. General
2. Types
  - a. General
  - b. Clay
  - c. Salt mud
  - d. Sandy
  - e. Other
3. Surveys (See 2.2.6)
4. Other

**6. Water and Steam**

1. General
2. Boiler and boiler feed water, and steam condensate
3. Brackish waters
4. Cooling waters
5. Distilled and demineralized waters
6. Domestic waters
7. Fresh water
8. Mine waters
9. Oil well brines
10. Brines
11. Sea water
12. Sub-surface Injection water (oil fields)
13. Waste waters and sewage
14. Other

**7. Molten Metals (Liquid Metals)****8. Other****5. PREVENTIVE MEASURES****1. General****2. Cathodic Protection**

1. General
2. Anodes—Sacrificial (galvanic)
  - a. General
  - b. Magnesium
  - c. Zinc
  - d. Other
3. External Current Source
  - a. General
  - b. Anodes
  - c. Engine and Other Generators
  - d. Rectifiers
  - e. Other
4. Criteria of Protection
5. Other

**3. Metallic Coatings**

1. General
2. Specific Coating
  - a. General
  - b. Aluminum
  - c. Cadmium
  - d. Chromium
  - e. Copper
  - f. Gold
  - g. Indium
  - h. Lead
  - i. Magnesium
  - j. Manganese
  - k. Molybdenum
  - l. Nickel
  - m. Silver
  - n. Tin
  - o. Tungsten
  - p. Zinc
  - q. Other
3. Specifications
4. Techniques
  - a. General
  - b. Cladding
  - c. Chemical Reduction
  - d. Diffusion Alloying
    - (1) General
    - (2) Calorizing
    - (3) Corroding
    - (4) Sherardizing
    - (5) Other
  - e. Electrodeposition
  - f. Hot Dip
    - (1) General
    - (2) Lead
    - (3) Tin
    - (4) Zinc (galvanizing)
    - (5) Other
  - g. Tinning

**5. PREVENTIVE MEASURES (Continued)**

- h. Vaporizing—Metalizing
- i. Other
5. Other

**4. Non-metallic Coatings and Paints**

1. General
2. Inorganic Coatings
  - a. General
  - b. Cementiferous
  - c. Natural oxide
  - d. Porcelain
  - e. Silicate base
  - f. Other
3. Linings
4. Removers (See 5.9.2)
5. Solid Organic Coatings
  - a. General
  - b. Asphalt
  - c. Bituminous
  - d. Lacquers
  - e. Primers
  - f. Plastics
    - (1) Thermoplastic
    - (2) Thermosetting
  - g. Strip-off materials
  - h. Other
6. Specifications
7. Techniques of Application
  - a. General
  - b. Baking
  - c. Brush
  - d. Flame spray
  - e. Mechanical Spray
  - f. Steam spray
  - g. Other
8. Uses
  - a. General
  - b. Acid-resistant
  - c. Alkali-resistant
  - d. Anti-fouling
  - e. Decorative
  - f. Fire retardant and heat resistant
  - g. Weather resistant
  - h. Other
9. Other
10. Composite Coating Systems for Pipes and Underground Cables (Coverings)

**5. Oil and Grease Coatings**

1. General
2. Heavy greases
3. Preservative oils
4. Other

**6. Packaging**

1. General
2. "Cocoon" Method
3. Other

**7. Treatment of Medium**

1. General
2. Aeration
3. Deaeration
4. Dehumidification
5. Desalting
6. Ion Exchange
7. pH Control
  - a. General
  - b. Neutralization
  - c. Other
8. Sequestering Agents
9. Other
10. Addition
11. Inhibitors and Passivators
  1. General
  2. Application
  3. Mechanism
  4. Types
    - a. General
    - b. Inorganic
    - c. Organic
  5. Other

**9. Surface Treatment**

1. General
2. Chemical and electrochemical cleaning
  - a. General
  - b. Caustic cleaning
  - c. Electrolytic cleaning
  - d. Hydride descaling
  - e. Pickling (acid cleaning)
  - f. Vapor-phase and solvent cleaning
  - g. Other
3. Mechanical Cleaning
  - a. General
  - b. Barrel finishing
  - c. Flame cleaning
  - d. Sand and shot blasting
  - e. Shot peening
  - f. Vapor blasting
  - g. Other
4. Surface Conversion
  - a. General
  - b. Anodizing
  - c. Chromatizing
  - d. Electropolishing
  - e. Phosphatizing
  - f. Other
5. Other

**10. Other****11. Design—Influence on Corrosion****6. MATERIALS OF CONSTRUCTION****1. General****2. Ferrous Metals and Alloys**

1. General
2. Iron
  - a. General
  - b. Cast
  - c. Electrolytic
  - d. Wrought
  - e. Other
3. Steel, Plain Carbon
4. Low Alloys
5. High Alloys
6. Other

**3. Non-ferrous Metals and Alloys—Heavy**

1. General
2. Cadmium
3. Chromium
4. Cobalt and cobalt alloys
5. Columbium (Niobium)
6. Copper and copper alloys
  - a. General
  - b. Copper
  - c. Cu-Zn alloys
  - d. Cu-Ni alloys
  - e. Cu-Sn alloys
  - f. Cu-Si alloys
  - g. Cu-Be alloys
  - h. Other
7. Indium and indium alloys
8. Lead and lead alloys
9. Molybdenum
10. Nickel and nickel alloys
  - a. General
  - b. Nickel
  - c. Ni-Cu alloys
  - d. Ni-Cr alloys
  - e. Ni-Mn alloys
  - f. Ni-Mo and Ni-Mo-Fe (Cr) alloys
  - g. Other
11. Noble metals and alloys
  - a. General
  - b. Gold
  - c. Palladium
  - d. Platinum
  - e. Rhodium
  - f. Silver
  - g. Other
12. Rhenium
13. Tantalum
14. Tin
15. Titanium
16. Tungsten (Wolfram)
17. Uranium
18. Vanadium
19. Zinc
20. Zirconium
21. Other

**4. Non-ferrous Metals and Alloys—Light**

1. General
2. Aluminum and Aluminum Alloys
3. Beryllium
4. Magnesium and Magnesium Alloys
5. Other
5. Metals—Multiple or Combined
6. Non-Metallic Materials

1. General
2. Asbestos
3. Boron
4. Carbon, Graphite, and Impregnated Materials
5. Cement and Concrete
6. Ceramics
  - a. General
  - b. Brick
  - c. Glass and vitreous silica
  - d. Stone and stoneware
  - e. Other
7. Natural and Synthetic Rubber
  - a. General
  - b. Natural
  - c. Synthetic
  - d. Mixtures
  - e. Other
8. Plastic (other than rubber)
  - a. General
  - b. Thermosets
    - (1) Phenolics
    - (2) Ureas
    - (3) Melamines
    - (4) Polyesters
  - c. Thermoplastics
    - (1) Cellulosics
      - (a) Nitrates
      - (b) Acetates
      - (c) Butyrates
      - (d) Ethyls
    - (2) Synthetics
      - (a) Vinyls
      - (b) Acrylics
      - (c) Polystyrenes

**6. MATERIALS OF CONSTRUCTION (Continued)**

- (d) Nylons
- (e) Polyethylenes
- d. Specialties
  - (1) Silicones
  - (2) Fluorocarbons
  - (3) Electropastics
9. Silicon
10. Textile
11. Wood
12. Other

**7. Duplex Materials**

1. General
2. Ceramics-Metals
3. Duplex Metallic Materials
4. Other

**8. Other****7. EQUIPMENT**

1. Engines, Bearings, and Turbines
2. Valves, Pipes, and Meters
3. Pumps, Compressors, Propellers, and Impellers
4. Heat Exchangers
  1. General
  2. Coils and Condensers
  3. Sprays
  4. Other
5. Containers
  1. General
  2. Cans
  3. Caskets
  4. Gas Holders
  5. Tanks
  6. Other
6. Unit Process Equipment
  1. General
  2. Agitators
  3. Autoclaves
  4. Boilers
  5. Concentrators
  6. Digestors
  7. Filters
  8. Fractionating Towers and Distillation Equipment
  9. Other
7. Electrical, Telephone and Radio
8. Wires and Cables (non-electrical)
9. Specifications
10. Other

**6. Unit Process Equipment**

1. General
2. Agitators
3. Autoclaves
4. Boilers
5. Concentrators
6. Digestors
7. Filters
8. Fractionating Towers and Distillation Equipment
9. Other
7. Electrical, Telephone and Radio
8. Wires and Cables (non-electrical)
9. Specifications
10. Other

**8. INDUSTRIES**

1. Group 1
  1. Air Conditioning
  2. Architecture and Building
  3. Refrigeration
  4. Sewage and Water
2. Group 2
  1. Communications
  2. Power
3. Group 3
  1. Agriculture
  2. Beverage
  3. Dairy
  4. Fermentation
  5. Food
  6. Sugar
  7. Starch
4. Group 4
  1. Fuel, Solid
  2. Fuel, Gas
  3. Petroleum Refining and Production
  4. Rubber
  5. Atomic Energy
5. Group 5
  1. Ceramics
  2. Glass
  3. Pulp and Paper
  4. Wood Products
6. Group 6
  1. Laundry
  2. Soap and Synthetic Detergents
  3. Textiles
7. Group 7
  1. Graphic Arts
  2. Instruments
  3. Jewelry
  4. Photography
8. Group 8
  1. Chemical Manufacturing
  2. Distilled Liquor
  3. Electroplating
  4. Leather and Tanning
  5. Metal Fabrication and Finishing
  6. Pharmaceuticals
9. Group 9
  1. Aircraft
  2. Automotive
  3. Pipe Line
  4. Railroad
  5. Shipping
10. Group 10
  1. Explosives
  2. Metallurgy
  3. Mining
  4. Ordnance and War Materials
  5. Other





[illegible]





[illegible]



[illegible][illegible][illegible]



Vol. 1

Farr,  
E  
Field  
Dis  
o  
Flour  
Top  
in  
th  
Font  
Dis  
A  
R  
d  
Alis  
Freeb  
Dis  
E  
Godan  
Dis  
C  
Grain  
A  
R  
d  
Alis  
Green  
Dis  
Green  
See  
Green  
Dis  
ni  
Stud  
ro  
Alis  
Hadley  
Dis  
M  
P  
Hastie  
Dis  
tr  
Hausen  
Dis  
So  
Hayw  
Corr  
un  
ted  
Heinen  
Dis  
C  
Hender  
Re  
gr  
th  
Dis  
Co  
Un  
C  
Dis  
Co  
Un  
C  
Higgin  
Dis  
Ba  
tio  
Hirsh  
sio  
Holm,  
Dis  
ne  
Horton  
Dis  
Co  
Hovis  
Ac  
Re  
diu  
Hurley  
Elect  
Fe  
W.  
Husch  
All-E  
tio  
Hutchin  
See F  
Imhoff,  
Ident  
uct  
tur  
Ingleson  
See F

Farr, E  
 Field, Dis  
 Flour, in  
 Top, r  
 Fonta, Dis  
 Als  
 Freeb, R  
 Dis, E  
 Godan, Dis  
 Grant, C  
 Dis, A  
 R, d  
 Als  
 Green, Dis  
 Green, of  
 See, n  
 Green, r  
 Stud, r  
 Also, r  
 Hadle, Dis  
 M, P  
 Hastie, Dis  
 tr, P  
 Hausm, Dis  
 So, t  
 Haywa, Corr  
 ur, te  
 Heinze, Dis  
 C, Co  
 Hende, Mag  
 Re, g  
 Dis, th  
 C, Co  
 Dis, Ca  
 Un, Ca  
 Higgin, Dis  
 Es, Co  
 Hirshf, Dis  
 Dis, s  
 Holm, Dis  
 ne, Co  
 Horton, Dis  
 Dis, Co  
 Howar, Dis  
 Ac, Co  
 Re, di  
 Hurley, Elect  
 Fe, v  
 Husche, F  
 All-F, t  
 Hutchin, See F  
 Imhoff, Ident  
 uct, r  
 tur, r  
 Ingleso, See F

**D (Cont'd)**

- |  |    |     |
|--|----|-----|
| <b>Denison, Irving A.</b>  |    |     |
| Corrosion of Galvanized Steel in<br>Soils, with Melvin Romanoff . . .                  | 53 | 132 |
| Corrosion of Low-Alloy Irons and<br>Steels in Soils, with Melvin<br>Romanoff . . . . . | 53 | 141 |

- |   |    |     |
|---|----|-----|
| <b>Deuber, Carl G.</b>  |    |     |
| The Present Status of Bacterial Corrosion Investigations in the United States .....         | 53 | 95  |
| Discussion—The Present Status of Bacterial Corrosion Investigations in the United States... | 53 | 244 |

- |   |    |
|---|----|
| <b>Devoluy, R. P.</b>   |    |
| Behavior of Shipbottom Paints Subjected to Cathodic Protection—A Preliminary Study . . .                | 53 |
| Discussion—Behavior of Shipbottom Paints Subjected to Cathodic Protection—A Preliminary Study . . . . . | 53 |

- Dietze, Irwin C.**  
Report on the Activities of Technical Practices Committee 16 on Electrolysis and Corrosion of Cable Sheaths ..... 53 439

- |                                |    |     |
|--------------------------------|----|-----|
| <b>Dillon, Charles P.</b>      |    |     |
| Discussion—The Corrosion Engi- | 50 | 300 |
| neering—Uses, Properties       |    |     |

- neer Uses Plastics ..... 53 188
- Donovan, L. B.**  
Topic of the Month—Flotation

- |   |    |   |
|---|----|---|
| Painting Gas Holders at 69,000<br>Square Feet an Hour (News<br>Section) ..... | 53 | 1 |
|---|----|---|

- Dudley, William**  
Discussion—Cable System Design  
for Cathodic Protection Reactions

- |  |    |     |
|--|----|-----|
| for Cathodic Protection Rectifiers ..... | 53 | 384 |
|--|----|-----|
- Duly, S. J.**

- Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 414

- Durose, A. H.**  
Discussion—Statistics—A Useful  
Tool for the Examination of

- |                      |    |     |
|----------------------|----|-----|
| Corrosion Data ..... | 53 | 242 |
|----------------------|----|-----|

- E
- Edwards W H

- Discussion—Studies on Water-Dependent Corrosion in Sweet

- |                                  |    |     |
|----------------------------------|----|-----|
| Oil Wells .....                  | 53 | 312 |
| <b>Eilerts, C. Kenneth</b>       |    |     |
| Discussion—Effect of Heat Treat- |    |     |

- ment and Related Factors on  
Straight Chromium Stainless  
Steels 52 103

- |                                  |    |     |
|----------------------------------|----|-----|
| Steels .....                     | 53 | 105 |
| <b>Eisler, Stanley L.</b>        |    |     |
| Radiometric Study of the Adsorp- |    |     |

- |            |    |    |
|------------|----|----|
| Acid ..... | 53 | 91 |
|------------|----|----|

- Elizer, Lee H.  
Discussion—The Amount and Dis-  
tribution of Corrosion ..... 53 333

- Discussion—Fundamental Concepts of Electrode Potentials .. 53 343

- Discussion—Resistance of Aluminum Alloys to Chemically Contaminated Atmospheres ..... 53 447

- Ellis, O. B.**  
Graphical Multiple Correlation of

- |  |    |     |
|--|----|-----|
| Corrosion Data .....   | 53 | 205 |
| Discussion—Graphical Multiple<br>Correlation of Corrosion Data ..... | 53 | 446 |

- Elkins, R. L.**  
Casing Corrosion in West Texas—

- |                                   |    |     |
|-----------------------------------|----|-----|
| New Mexico .....                  | 53 | 321 |
| Ewing, Scott P.                   |    |     |
| Response on Receipt of 1953 Frank |    |     |

- Response on Receipt of 1963 Frank  
Newman Speller Award ..... 53 191
- Cathodic Protection Applied to

- |  |    |     |
|--|----|-----|
| Tank Bottoms, with J. S. Hutchison ..... | 53 | 221 |
|--|----|-----|

- Discussion—Cathodic Protection  
Applied to Tank Bottoms ..... 53 231

- Discussion—Cable System Design  
for Cathodic Protection Recti-  
fiers ..... 53 384

- \_\_\_\_\_



## F

- Farr, A. P.**  
Evidence of Corrosion Failures in Drill Stem Members ..... 53 108
- Field, Paul**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 420
- Flournoy, R. W.**  
Topic of the Month—Plastic Piping for Electrical Conduit in Corrosive Atmospheres (News Section, August) ..... 53 1
- Fontana, Mars G.**  
Discussion—An Investigation of Accelerated Oxidation of Heat Resistant Metals Due to Vanadium ..... 53 466  
Also see Beck, F. H. .... 53 287
- Freeborn, A. G.**  
Discussion—Electrical Treatment Boiler Feed Waters ..... 53 258

## G

- Godard, Hugh P.**  
Discussion—Graphical Multiple Correlation of Corrosion Data ..... 53 446
- Grant, Nicholas J.**  
Discussion—An Investigation of Accelerated Oxidation of Heat Resistant Metals Due to Vanadium ..... 53 466  
Also see Monkman, Forest C. .... 53 460
- Green, Walter L.**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 410
- Greenblatt, J. H.**  
See Barnard, K. N. .... 53 246
- Greenwell, Howard E.**  
Discussion—The Coupon Technique—A Valuable Tool in Corrosion Testing ..... 53 73
- Studies on Water-Dependent Corrosion in Sweet Oil Wells** ..... 53 307  
Also see Bilhartz, H. L. .... 53 66

## H

- Hadley, R. F.**  
Discussion—Examination of 335 Miles of Asphalt Mastic Coated Pipe ..... 53 215
- Hastie, C.**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 419
- Hausman, Robert F.**  
Discussion—Corrosion by Aqueous Solutions at Elevated Temperatures and Pressures ..... 53 383
- Hayward, H. N.**  
Corrosion Instruments and Measurements Handbook is Committee's Objective ..... 53 335
- Heinemann, Gustav**  
Discussion—Kel-F Applications in Corrosive Systems ..... 53 294
- Henderson, Oliver**  
Magnetic Amplifier Controls for Rectifier Protecting Underground Metallic Structures Cathodically ..... 53 216
- Discussion—Magnetic Amplifier Controls for Rectifier Protecting Underground Metallic Structures Cathodically** ..... 53 294
- Discussion—Magnetic Amplifier Controls for Rectifier Protecting Underground Metallic Structures Cathodically** ..... 53 382
- Higgins, W. F.**  
Discussion—The Present Status of Bacterial Corrosion Investigations in the United States ..... 53 243
- Hirshfeld, J. F.**  
Discussion—Cable Sheath Corrosion and Prevention ..... 53 430
- Holm, E. G.**  
Discussion—The Corrosion Engineer Uses Plastics ..... 53 188
- Horton, John Leroy**  
Discussion—Graphical Multiple Correlation of Corrosion Data ..... 53 446
- Howard, Robert Turner**  
Discussion—An Investigation of Accelerated Oxidation of Heat Resistant Metals Due to Vanadium ..... 53 466
- Hurley, T. F.**  
Electrical Treatment of Boiler Feed Waters, with H. Ingleson, W. J. Sparkes and R. Wilkinson ..... 53 321
- Huscher, J. L.**  
All-Plastic Materials of Construction for Corrosive Environments ..... 53 272
- Hutchison, J. S.**  
See Ewing, Scott P. .... 53 221

## I

- Inhoff, C. E.**  
Identification of Corrosion Products According to Crystal Structure Underway ..... 53 209
- Ingleson, H.**  
See Hurley, T. F. .... 53 251

## J

- Jacklin, C.**  
Topic of the Month—Amines for Corrosion Prevention in Steam Condensate Systems (News Section, July) ..... 53 1
- Jelen, F. C.**  
Discussion—Graphical Multiple Correlation of Corrosion Data ..... 53 446
- Jupp, William B.**  
Symposium on Control of Internal Corrosion of Tankers, with J. V. C. Malcolmson, W. S. Quimby, Gwendolyn D. Pingrey, J. C. D. Oosterhout and A. B. Kurz ..... 53 387
- Discussion—Symposium on Control of Internal Corrosion of Tankers** ..... 53 422

## K

- Kalish, Paul J.**  
Laboratory Apparatus for Studying Oil Well Subsurface Corrosion Rates and Some Results, with J. A. Rowe, Jr. and W. F. Rogers ..... 53 25
- Kauck, Edward**  
Discussion—Corrosion of Metals in Fluorine and Hydrofluoric Acid ..... 53 75
- Kessler, Kenneth R.**  
Organization and Function of Technical Practices Committee 15 on Corrosion Control in the Transportation Industry ..... 53 385
- Kinney, W. L.**  
Discussion—Examination of 335 Miles of Asphalt Mastic Coated Pipe ..... 53 215
- Koester, H. F.**  
A Method of Determining the Resistance of Insulating Joints and Pipe Line Coatings ..... 53 159
- Kuhn, L. B.**  
Discussion—All-Plastic Materials of Construction for Corrosive Environments ..... 53 446
- Kulman, Frank E.**  
Microbiological Corrosion of Buried Steel Pipe ..... 53 11
- Kurz, A. B.**  
See Jupp, William B. .... 53 387
- Discussion—Symposium on Control of Internal Corrosion of Tankers** ..... 53 422
- Knowlton, Kenneth F.**  
Discussion—The Corrosion of Domestic Galvanized Hot Water Storage Tanks ..... 53 49

## L

- Laiderman, D. D.**  
See Van Loo, M. .... 53 277
- Lamb, Carl J.**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 418
- LaQue, F. L.**  
Effect of Composition of Steel on the Performance of Organic Coatings in Atmospheric Exposure, with James A. Boylan ..... 53 237
- Discussion—Symposium on Control of Internal Corrosion of Tankers** ..... 53 416
- Larabee, C. F.**  
Corrosion Resistance of High-Strength, Low-Alloy Steels as Influenced by Composition and Environment ..... 53 259
- Laster, Gaines**  
Topic of the Month—Portable Burner Cleans Exterior of Pipe Contaminated with Paraffin (News Section, September) ..... 53 1
- Lee, Robert P.**  
Discussion—Kel-F Applications in Corrosive Systems ..... 53 294
- Lewis, Charles F.**  
Statistics—A Useful Tool for the Examination of Corrosion Data ..... 53 38
- Discussion—Effect of Heat Treatment and Related Factors on Straight Chromium Stainless Steels** ..... 53 104
- Errata: Statistics—A Useful Tool for the Examination of Corrosion Data** ..... 53 105
- Discussion—Statistics—A Useful Tool for the Examination of Corrosion Data** ..... 53 242
- Liebhafsky, H. A.**  
Radiography as an Aid in Corrosion Studies, with A. E. Newkirk ..... 53 432
- Lloyd, Clyde C.**  
Cathodic Protection of Underriver Pipe Lines, with John R. Whitney ..... 53 303
- Lytle, M. L.**  
See Caldwell, J. A. .... 53 186  
See Caldwell, J. A. .... 53 192

## M

- Malcolmson, J. V. C.**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 422  
Also see Jupp, William B. .... 53 387

## M (Cont'd)

- Marsh, G. A.**  
Discussion—Corrosion of Metals in Fluorine and Hydrofluoric Acid ..... 53 75
- May, Thomas P.**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 416
- Miltner, Donald E.**  
Examination of 335 Miles of Asphalt Mastic Coated Pipe ..... 53 210
- Discussion—Examination of 335 Miles of Asphalt Mastic Coated Pipe** ..... 53 214
- Monkman, Forest C.**  
An Investigation of Accelerated Oxidation of Heat Resistant Metals Due to Vanadium, with Nicholas J. Grant ..... 53 460
- Discussion—An Investigation of Accelerated Oxidation of Heat Resistant Metals Due to Vanadium** ..... 53 466
- Moore, R. W.**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 421
- Moore, Stanley C.**  
Drill Stem Corrosion in West Texas ..... 53 112
- Morrell, Robert W.**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 410
- Mosher, L. M.**  
Topic of the Month—Scale vs Bare Steel Potential Differences May Explain Unusual Tank Vessel Corrosion (News Section, May) ..... 53 1
- McCutchen, C. W.**  
Discussion—Kel-F Applications in Corrosive Systems ..... 53 188
- McFarland, R.**  
Topic of the Month—Phenolic-Butadiene-Acrylonitrile Polymers for Pipe and Pipe Fittings (News Section, April) ..... 53 1
- McIntyre, G. H.**  
Discussion—Corrosion of Metals in Fluorine and Hydrofluoric Acid ..... 53 75
- Nathan, Charles C.**  
Discussion—Laboratory Apparatus for Studying Oil Well Subsurface Corrosion Rates and Some Results ..... 53 33
- Studies on the Inhibition by Amines of the Corrosion of Iron by Solutions of High Acidity** ..... 53 199
- Newell, L. Laird**  
The Corrosion of Domestic Galvanized Hot Water Storage Tanks ..... 53 46
- Newkirk, A. E.**  
See Liebhafsky, H. A. .... 53 432
- Noek, J. A., Jr.**  
See Walton, C. J. .... 53 345
- Oosterhout, J. C. D.**  
See Jupp, William B. .... 53 387
- Osborn, Oliver**  
Discussion—Behavior of Shipbottom Paints Subjected to Cathodic Protection—A Preliminary Study ..... 53 9
- Discussion—Evidence of Corrosion Failures in Drill Stem Members** ..... 53 113
- Discussion—Drill Stem Corrosion in West Texas** ..... 53 113
- Oxford, William F., Jr.**  
Discussion—Laboratory Apparatus for Studying Oil Well Subsurface Corrosion Rates and Some Results ..... 53 33
- Parker, Herbert F.**  
Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53 420
- Patzelt, Harold**  
A Laboratory Method for the Study of Steam Condensate Corrosion Inhibitors ..... 53 19
- Pierce, Robert R.**  
Discussion—Corrosion of Metals in Fluorine and Hydrofluoric Acid ..... 53 74
- Pingrey, Gwendolyn D.**  
See Jupp, William B. .... 53 387
- Piontelli, R.**  
Electrochemical Behavior of Metals as a Basis for the Study of Corrosion ..... 53 115
- Prange, F. A.**  
Designing for Corrosive Services ..... 53 34
- Discussion—Corrosion of Metals in Fluorine and Hydrofluoric Acid** ..... 53 76
- Pratt, Ward E.**  
Discussion—Corrosion of Metals in Fluorine and Hydrofluoric Acid ..... 53 74
- Pryor, M. J.**  
Corrosion of Steel in Dilute Solutions of Sodium Salts of Weak Acids ..... 53 467

Q	S (Cont'd)	W
<b>Quimby, W. S.</b> See Jupp, William B. .... 53	<b>Sheard, H. G.</b> Discussion—Magnetic Amplifier Controls for Rectifier Protecting Underground Metallic Structures Cathodically ..... 53	<b>Wachter, A.</b> See Skel, T. .... 53
R	<b>Sheppard, Lyle R.</b> Discussion—Examination of 335 Miles of Asphalt Mastic Coated Pipe ..... 53	<b>Wade, O. W.</b> Discussion—Examination of 335 Miles of Asphalt Mastic Coated Pipe ..... 53
<b>Rayner, R. L.</b> Discussion—Effects of Polarization on Telephone Cable Buried Through a Salt Bed ..... 53	<b>Skel, T.</b> Hydrogen Blistering of Steel in Hydrogen Sulfide Solutions, with A. Wachter, W. A. Bonner and H. D. Burnham ..... 53	<b>Wagner, R. H.</b> See also Binger, W. W. .... 53
<b>Reichard, Edmund C.</b> Discussion—Behavior of Shipbottom Paints Subjected to Cathodic Protection—A Preliminary Study ..... 53	<b>Skinner, E. N.</b> Discussion—Some Notes on the Oxidation Resistance of Boron-Containing Chromium-Nickel-Cobalt-Iron Alloys ..... 53	<b>Wahlquist, H. W.</b> Topic of the Month—Some Corrosion Hazards From DC Welding Currents (News Section, November) ..... 53
<b>Reinitz, B. B.</b> Cable Sheath Corrosion and Prevention ..... 53	<b>Slunder, Charles J.</b> Discussion—An Investigation of Accelerated Oxidation of Heat Resistant Metals Due to Vanadium ..... 53	<b>Walnwright, Ray M.</b> Economic Aspects of Cathodic Protection ..... 53
<b>Rice, E. L.</b> Discussion—Kel-F Applications in Corrosive Systems ..... 53	<b>Sparkes, W. J.</b> See Hurley, T. F. .... 53	<b>Wallace, E. W.</b> Discussion—Graphical Multiple Correlation of Corrosion Data. .... 53
<b>Richards, John T.</b> Corrosion Resistance of Beryllium Copper—A Survey ..... 53	<b>Spraul, J. Robert</b> Organization and Activities of Technical Practices Subcommittee 15A on Corrosion Control in Railroad Tank Cars ..... 53	<b>Wallace, E. W.</b> Discussion—Graphical Multiple Correlation of Corrosion Data. .... 53
<b>Riegel, Garland M.</b> Discussion—Kel-F Applications in Corrosive Systems ..... 53	<b>Sproles, D. O.</b> See Walton, C. J. .... 53	<b>Walton, C. J.</b> Resistance of Aluminum Alloys to Weathering, with D. O. Sproles and J. A. Nock, Jr. .... 53
<b>Roeske, John F.</b> Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53	<b>Staufacher, E. R.</b> Field Tests of Exterior Coating for a Pipe Line Conveying Fuel Oil Heated to 200 Degrees F, with R. R. Davidson ..... 53	<b>Wanderer, Edward T.</b> Topic of the Month—Aluminum Coiled Tube (News Section, February) ..... 53
<b>Rogers, W. F.</b> Discussion—Laboratory Apparatus for Studying Oil Well Subsurface Corrosion Rates and Some Results ..... 53	<b>Sudbury, J. D.</b> Discussion—Laboratory Apparatus for Studying Oil Well Subsurface Corrosion Rates and Some Results ..... 53	<b>Wanderer, Edward T.</b> Topic of the Month—Aluminum Coiled Tube (News Section, February) ..... 53
<b>Roll, Kempton H.</b> Discussion—Corrosion of Metals in Fluorine and Hydrofluoric Acid ..... 53	<b>Sudrabin, L. P.</b> Discussion—Behavior of Shipbottom Paints Subjected to Cathodic Protection—A Preliminary Study ..... 53	<b>Weis, John W.</b> Discussion—Corrosion by Aqueous Solutions at Elevated Temperatures and Pressures ..... 53
<b>Romanoff, Melvin</b> See Denison, Irving A. .... 53	<b>Teeters, W. O.</b> Discussion—Kel-F Applications in Corrosive Systems ..... 53	<b>Weisert, E. D.</b> Discussion—Some Notes on the Oxidation Resistance of Boron-Containing Chromium-Nickel-Cobalt-Iron Alloys ..... 53
<b>Rosselle, D. T.</b> Topic of the Month—Cooperative Corrosion Protection Benefits Miami Utilities (News Section, June) ..... 53	<b>Treseder, Richard S.</b> Discussions—Effect of Heat Treatment and Related Factors on Straight Chromium Stainless Steels ..... 53	<b>Werner, Daniel R.</b> Effects of Polarization on Telephone Cable Buried Through a Salt Bed ..... 53
<b>Rowe, J. A. Jr.</b> Discussion—Laboratory Apparatus for Studying Oil Well Subsurface Corrosion Rates and Some Results ..... 53	<b>Tunderman, Werner O.</b> Discussion—Corrosion by Aqueous Solutions at Elevated Temperatures and Pressures ..... 53	<b>Whitaker, G. C.</b> Discussion—Corrosion of Metals in Fluorine and Hydrofluoric Acid. .... 53
<b>Rubin, L. C.</b> Kel-F Applications in Corrosive Systems, with W. O. Teeters. .... 53	<b>Uhlig, H. H.</b> Discussion—The Amount and Distribution of Corrosion ..... 53	<b>Whitney, Frank L., Jr.</b> The Corrosion Engineer Uses Plastics ..... 53
<b>Ruddock, William M.</b> Discussion—Kel-F Applications in Corrosive Systems ..... 53	<b>Vanderpool, Howard</b> Topic of the Month—Metallizing as an Aid to Chemical Manufacturers (News Section, December) ..... 53	<b>Whitney, John R.</b> See Loyd, Clyde C. .... 53
<b>Ruddock, William M.</b> Discussion—Kel-F Applications in Corrosive Systems ..... 53	<b>Van Loo, M.</b> Filiform Corrosion, with D. D. Laiderman and R. R. Bruhn. .... 53	<b>Wiley, N. C.</b> Discussion—Symposium on Control of Internal Corrosion of Tankers ..... 53
S	<b>Van Nieuhuys, H. C.</b> Discussion—Examination of 335 Miles of Asphalt Mastic Coated Pipe ..... 53	<b>Wilkinson, R.</b> See Hurley, T. F. .... 53
<b>Scheil, M. A.</b> Report of the Activities of Technical Practices Committee 7—Materials for Use at High Temperature ..... 53	<b>Wright, Lewis S.</b> Discussion—Hydrogen Blistering of Steel in Hydrogen Sulfide Solutions ..... 53	<b>Wise, R. S.</b> List of Corrosion Inhibitors Compiled—A Report by Technical Practices Committee 9, with F. M. Watkins ..... 53
<b>Schmidt, H. W.</b> Technical Practices Committee 5—Corrosion Problems Involved in the Processing of Chemicals. .... 53	<b>Wright, T. E.</b> Discussion—Statistics—A Useful Tool for the Examination of Corrosion Data ..... 53	<b>Wright, T. E.</b> Discussion—Statistics—A Useful Tool for the Examination of Corrosion Data ..... 53
<b>Schmoker, R. F.</b> Discussion—Examination of 335 Miles of Asphalt Mastic Coated Pipe ..... 53	<b>Wright, T. E.</b> Discussion—Statistics—A Useful Tool for the Examination of Corrosion Data ..... 53	<b>Zapffe, Carl A.</b> Corrosion-Fatigue Failure of a Marine Propeller Shaft ..... 53
<b>Schmoldt, Hans</b> Topic of the Month—Visual Identification of Line Pipe (News Section, October) ..... 53	<b>Zastrow, Orville W.</b> Discussion—Cathodic Protection and High Resistivity Soil ..... 53	<b>Zastrow, Orville W.</b> Discussion—Cathodic Protection and High Resistivity Soil ..... 53
<b>Schwab, C. M.</b> Discussion—The Coupon Technique—A Valuable Tool in Corrosion Testing ..... 53	<b>Zastrow, Orville W.</b> Discussion—Cathodic Protection and High Resistivity Soil ..... 53	<b>Zastrow, Orville W.</b> Discussion—Cathodic Protection and High Resistivity Soil ..... 53
<b>Seymour, R. B.</b> Plastic Materials of Construction, Discussion—Plastic Materials of Construction ..... 53	<b>Zastrow, Orville W.</b> Discussion—Cathodic Protection and High Resistivity Soil ..... 53	<b>Zastrow, Orville W.</b> Discussion—Cathodic Protection and High Resistivity Soil ..... 53
<b>Seymour, R. B.</b> References on Plastics for the Corrosion Engineer ..... 53	<b>Zastrow, Orville W.</b> Discussion—Cathodic Protection and High Resistivity Soil ..... 53	<b>Zastrow, Orville W.</b> Discussion—Cathodic Protection and High Resistivity Soil ..... 53

# CORROSION ABSTRACTS

As Published in

## CORROSION

Volume 9-1953

Official Publication

NATIONAL ASSOCIATION OF CORROSION ENGINEERS

1061 M & M Building, Houston 2, Texas

COPYRIGHTED, 1953

### PAGE NUMBERS BY MONTHS

#### Pages

1- 10 ..... January  
11- 20 ..... February  
21- 48 ..... March  
48- 70 ..... April  
71-100 ..... May  
101-142 ..... June

#### Pages

143-164 ..... July  
165-180 ..... August  
181-206 ..... September  
207-244 ..... October  
245-262 ..... November  
263-290 ..... December

1 GEN

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

2 TEST

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

3 CHA

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

4 COR

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

5 PRE

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

6 MA

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

7 EQ

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

8 IV

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.



# INDEX TO CORROSION ABSTRACTS, Volume 9, 1953

Numbers in this table are those printed in the lower outer margins of the Corrosion Abstract Section, cumulative through the volume. Topical headings in the left column are those of the first and second subdivisions of the NACE Abstract Filing Index, revision of September 1952. This index may be found reproduced in full as part of the Index to Technical Material Published in Corrosion in the December,

1953 issue of Corrosion. Principal difference between this index and that published in the December, 1951 issue is the addition of designation 6.11 Design, Influence on Corrosion. Refer to footnotes for changes in 8. Industries not affecting validity of indexing of previous abstracts.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
<b>1 GENERAL</b>													1
1. Miscellaneous			21				143						1
2. Importance				49		101	144		181			263	2
3. Reviews			22			102			182				3
4. Bibliographies							144					264	4
5. Directories of Material			22										5
6. Books				49				165					6
7. Organized Studies of Corrosion			22	50		102		165		207		264	7
8. Personalities and Directories of Individuals													8
<b>2 TESTING</b>													
1. General				50									1
2. On Location Tests			24	50		104			182			264	2
3. Laboratory Methods and Tests			24	52	71	106	144	166	182	207		266	3
4. Instrumentation			24	54		107	144	168	186		245	266	4
5. Specifications and Standardization			24			108							5
6. Preparation and Cleaning of Specimens	1												6
7. Other													7
<b>3 CHARACTERISTIC PHENOMENA</b>													
1. General								168					1
2. Forms			24	54		108	144	168	188	210		268	2
3. Biological Effects			25	56		109	146	168	192	210			3
4. Chemical Effects			25	56		109	146		182	210			4
5. Physical and Mechanical Effects	1		26	57		110	146		194	211	248	274	5
6. Electrochemical Effects	2		26		72	110	146				248	275	6
7. Metallurgical Effects	2	11	26		73	110	148				248		7
8. Miscellaneous Principles		12	27		76	112	148				249	278	8
9. Other													9
<b>4 CORROSIVE ENVIRONMENTS</b>													
1. General													1
2. Atmospheric			23				148	169			251	282	2
3. Chemicals, Inorganic		12				116	148	169			251	282	3
4. Chemicals, Organic	4					116		169			252	284	4
5. Soil		12					150	170				284	5
6. Water and Steam	5		28			118	150				252	284	6
7. Molten Metals							150	170				284	7
8. Other													8
<b>5 PREVENTIVE MEASURES</b>													
1. General								170					1
2. Cathodic Protection			28	58		118		170	196		252	286	2
3. Metallic Coatings		12	28	60	78	120		170		211	254		3
4. Non-Metallic Coatings and Paints	6	13	28	60		122	152	172	196	211			4
5. Oil and Grease Coatings	6			63		122	156			216			5
6. Packaging				63				172					6
7. Treatment of Medium			30	63				173		216			7
8. Inhibitors and Passivators	8		30	64	80		156	173		216			8
9. Surface Treatment		13	31		80		157	174	200	218		286	9
10. Other													10
11. Design, Influence of		14			84				201	224			11
<b>6 MATERIALS OF CONSTRUCTION</b>													
1. General		15			84				201		256		1
2. Ferrous Metals and Alloys			32		84	126			202		258		2
3. Non-ferrous Metals and Alloys—Heavy			34	66	86	128		174		224	258	298	3
4. Non-ferrous Metals and Alloys—Light			33	66	88	130	158	178		230			4
5. Metals—Multiple or Combined Discussion										233			5
6. Non-Metallic Materials			44			131	160			233		288	6
7. Duplex Materials			46			131	160	179		234			7
8. Other													8
<b>7 EQUIPMENT</b>													
1. Engines, Bearings and Turbines			46	66	90	135		179		236			1
2. Valves, Pipes, and Meters		15		67	92	136				236	258		2
3. Pumps, Compressors, Propellers, and Impellers		16			94	137				236	260		3
4. Heat Exchangers					94	137							4
5. Containers		16			95	137	160			236			5
6. Unit Process Equipment		16			95	137							6
7. Electrical Telephone and Radio					95	139				237			7
8. Wires and Cables (non-electrical)					96		160	179					8
9. Specifications													9
10. Other							160				260		10
<b>8 INDUSTRIES*</b>													
1. Group 1	8			68	96	140	160			238			1
2. Group 2					96					238			2
3. Group 3							160			238			3
4. Group 4		18			96	140	162	179		238			4
5. Group 5		18		69	97		162			240			5
6. Group 6					99		162						6
7. Group 7					99					240			7
8. Group 8		18		69	99	141	162			240			8
9. Group 9		18		69	99		162	179		242			9
10. Group 10					99		163	179					10

\*The following designations apply to the several groups listed under 8. INDUSTRIES:

- Air conditioning, architecture and building, refrigeration, sewage and water.
- Communications, power.
- Agriculture, beverage, dairy, fermentation, food, sugar, starch.
- Fuel, solids; fuel, gases; petroleum refining and production, rubber, atomic energy.
- Ceramics, glass, pulp and paper, wood products.
- Laundry, soap and detergents, textiles.
- Graphic arts, instruments, jewelry, photography.
- Chemical manufacturing, distilled liquor, electroplating, leather and tanning, metal fabrication and finishing, pharmaceuticals.
- Aircraft, automotive, pipe line, railroad, shipping.
- Explosives, metallurgy, mining ordnance and war materials, other.